McGraw-Hill Dictionary of Scientific and Technical Terms

Fifth Edition

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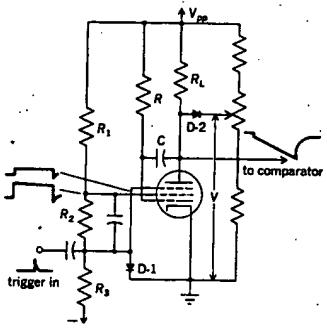
PHANTASTRON

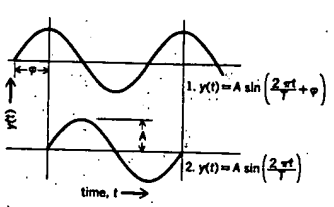


Circuit diagram of screen-coupled phantastron delay circuit. Resistors R_1, R_2, and R_3 form divider which prevents plate current from flowing before trigger pulse is applied. D-1, D-2 are diodes. V is voltage from which plate starts, determined by divider to which diode D-2 is connected. R_L = load resistor, V_{pp} = plate supply voltage.

PHARYNGOBDELLAE

Dorsal and ventral view of *Erpobdella punctata*, a jawless leech common in lakes and streams in the Northern Hemisphere.

PHASE ANGLE



An illustration of the meaning of phase for a sinusoidal wave, $y(t)$. The difference in phase between waves 1 and 2 is φ and is called the phase angle. For each wave, A is the amplitude and T is the period.

phantastran [ELECTR] A solid-state phantastron. { fan'tas,trän }

phantastron [ELECTR] A monostable pentode circuit used to generate sharp pulses at an adjustable and accurately timed interval after receipt of a triggering signal. { fan'tas,trän }

phantom [GEOL] A bed or member that is absent from a specific stratigraphic section but is usually present in a characteristic position in a sequence of similar geologic age. [NUCLEO] A volume of material approximating as closely as possible the density and effective atomic number of living tissue, used in biological experiments involving radiation. [PETR] *See* ghost. { 'fan·təm }

phantom bottom [OCEANOGR] A false bottom indicated by an echo sounder, some distance above the actual bottom; such an indication, quite common in the deeper parts of the ocean, is due to large quantities of small organisms. { 'fan·təm 'bäd·əm }

phantom circuit [COMMUN] A communication circuit derived from two other communication circuits or from one other circuit and ground, with no additional wire lines. { 'fan·təm 'sər·kət }

phantom-circuit loading coil [ELEC] Loading coil for introducing a desired amount of inductance into a phantom circuit, and a minimum amount of inductance into its constituent circuits. { 'fan·təm ¦sər·kət 'lōd·iŋ ˌkȯil }

phantom-circuit repeating coil [ELEC] Repeating coil used at a terminal of a phantom circuit, in the terminal circuit extending from the midpoints of the associated side-circuit repeating coils. { 'fan·təm ¦sər·kət ri'pēd·iŋ ˌkȯil }

phantom crystal [CRYSTAL] A crystal containing an earlier stage of crystallization outlined by dust, minute inclusions, or bubbles. Also known as ghost crystal. { 'fan·təm 'krist·əl }

phantom group [ELEC] **1.** Group of four open-wire conductors suitable for the derivation of a phantom circuit. **2.** Three circuits which are derived from simplexing two physical circuits to form a phantom circuit. { 'fan·təm 'grüp }

phantom horizon [GEOL] In seismic reflection prospecting, a line constructed so that it is parallel to the nearest actual dip segment at all points along a profile. { 'fan·təm hə'rīz·ən }

phantom repeating coil [ELEC] A side-circuit repeating coil or a phantom-circuit repeating coil when discrimination between these two types is not necessary. { 'fan·təm ri'pēd·iŋ ˌkȯil }

phantom signals [ELECTR] Signals appearing on the screen of a cathode-ray-tube indicator, the cause of which cannot readily be determined and which may be caused by circuit fault, interference, propagation anomalies, jamming, and so on. { 'fan·təm 'sig·nəlz }

phantom target *See* echo box. { 'fan·təm 'tär·gət }

Pharetronida [INV ZOO] An order of calcareous sponges in the subclass Calcinea characterized by a leuconoid structure. { ˌfar·ə'trän·ə·də }

pharmaceutical chemistry [CHEM ENG] The chemistry of drugs and of medicinal and pharmaceutical products. { ˌfär·mə'süd·ə·kəl 'kem·ə·strē }

pharmacodynamics [PHARM] The science that deals with the actions of drugs. { ˌfär·mə·kō·dī'nam·iks }

pharmacogenetics [GEN] The science of genetically determined variations in drug responses. { ˌfär·mə·kō·jə'ned·iks }

pharmacognosy [PHARM] The science of crude drugs. { ˌfär·mə'käg·nə·sē }

pharmacokinetics [PHARM] The study of the way that drugs move through the body after they are swallowed or injected. { ˌfär·mə·kō·ki'ned·iks }

pharmacolite [MINERAL] $CaH(AsO_4)\cdot 2H_2O$ A white to grayish monoclinic mineral composed of hydrous acid arsenate of calcium, occurring in fibrous form. { 'fär·mak·əˌlīt }

pharmacologic pyrogen [PHARM] A naturally occurring pharmacologic agent, such as serotonin or a catecholamine that controls body temperature; it can cause fever when injected under experimental conditions. { ˌfär·mə·kə'läj·ik 'pī·rə·jən }

pharmacology [CHEM] The science dealing with the nature and properties of drugs, particularly their actions. { ˌfär·mə'käl·ə·jē }

pharmacophobia [PSYCH] Abnormal fear of medicine. { ˌfär·mə·kə'fō·bē·ə }

pharmacopoeia [PHARM] A book containing a selected list of medicinal substances and their dosage forms, providing also a description and the standards for purity and strength for each. { ˌfär·mə·kə'pē·ə }

pharmacosiderite [MINERAL] $Fe_3(AsO_4)_2(OH)_3\cdot 5H_2O$ Green or yellowish-green mineral composed of a hydrous basic iron arsenate and commonly found in cubic crystals. Also known as cube ore. { ˌfär·mə·kō'sīd·əˌrīt }

pharmacotherapy [MED] The treatment of disease by means of drugs. { ˌfär·mə·kō'ther·ə·pē }

pharmacy [MED] **1.** The art and science of the preparation and dispensation of drugs. **2.** A place where drugs are dispensed. { 'fär·mə·sē }

pharyngeal aponeurosis [ANAT] The fibrous submucous layer of the pharynx. { fə'rin·jē·əl ˌap·ō·nù'rō·səs }

pharyngeal bursa [EMBRYO] A small pit caudal to the pharyngeal tonsil, resulting from the ingrowth of epithelium along the course of the degenerating tip of the notochord of the vertebrate embryo. { fə'rin·jē·əl 'bər·sə }

pharyngeal cleft [EMBRYO] One of the paired open clefts on the sides of the embryonic pharynx between successive visceral arches in vertebrates. { fə'rin·jē·əl 'kleft }

pharyngeal plexus [ANAT] **1.** A nerve plexus innervating the pharynx. **2.** A plexus of veins situated at the side of the pharynx. { fə'rin·jē·əl 'plek·səs }

pharyngeal pouch [EMBRYO] One of the five paired sacculations in the lateral aspect of the pharynx in vertebrate embryos. Also known as visceral pouch. { fə'rin·jē·əl 'pauch }

pharyngeal tonsil *See* adenoid. { fə'rin·jē·əl 'tän·səl }

pharyngeal tooth [VERT ZOO] A tooth developed on the pharyngeal bone in many fishes. { fə'rin·jē·əl 'tüth }

pharyngitis [MED] Inflammation of the pharynx. { ˌfar·ən'jīd·əs }

Pharyngobdellae [INV ZOO] A family of leeches in the order Arhynchobdellae that is distinguished by the lack of jaws. { fəˌriŋˌgäb'del·əˌdē }

pharyngology [MED] The science of the pharyngeal mechanism, functions, and diseases. { ˌfar·iŋ'gäl·ə·jē }

pharyngoscope [MED] An instrument for examining the pharynx. { fə'riŋ·gəˌskōp }

pharynx [ANAT] A chamber at the oral end of the vertebrate alimentary canal, leading to the esophagus. { 'far·iŋks }

phase [ASTRON] One of the cyclically repeating appearances of the moon or other orbiting body as seen from earth. [CHEM] Portion of a physical system (liquid, gas, solid) that is homogeneous throughout, has definable boundaries, and can be separated physically from other phases. [MATH] An additive constant in the argument of a trigonometric function. [MET] A constituent of an alloy that is physically distinct and is homogeneous in chemical composition. [PHYS] **1.** The fractional part of a period through which the time variable of a periodic quantity (alternating electric current, vibration) has moved, as measured at any point in time from an arbitrary time origin; usually expressed in terms of angular measure, with one period being equal to 360° or 2π radians. **2.** For a sinusoidally varying quantity, the phase (first definition) with the time origin located at the last point at which the quantity passed through a zero position from a negative to a positive direction. **3.** The argument of the trigonometric function describing the space and time variation of a sinusoidal disturbance, $y = A \cos[(2\pi/\lambda)(x - vt)]$, where x and t are the space and time coordinates, v is the velocity of propagation, and λ is the wavelength. [THERMO] The type of state of a system, such as solid, liquid, or gas. { fāz }

phase advancer [ELEC] Phase modifier which supplies leading reactive volt-amperes to the system to which it is connected; may be either synchronous or asynchronous. { 'fāz ədˌvan·sər }

phase age *See* age of phase inequality. { 'fāz ˌāj }

phase-alternation line system [COMMUN] A color television system used in Europe, in which the phase of the color subcarrier is changed from scanning line to scanning line, requiring transmission of a line switching signal as well as a color burst. Abbreviated PAL system. { 'fāz ˌȯl·tər¦nā·shən ˌlīn ˌsis·təm }

phase angle [PHYS] The difference between the phase of a sinusoidally varying quantity and the phase of a second quantity which varies sinusoidally at the same frequency. Also known as phase difference. { 'fāz ˌaŋ·gəl }

phase-angle meter *See* phase meter. { 'fāz ¦aŋ·gəl ˌmēd·ər }

phase-balance relay [ELEC] Relay which functions by rea-

Sitinakite Mineral Data Pronunciation Guide

General Sitinakite Information

- Chemical Formula: Na2K(Ti,Nb)4O4(SiO4)2(O,OH)·4(H2O)
- Composition: Molecular Weight = 658.10 gm

Potassium	5.94 %	K	7.16 %	K_2O
Sodium	6.99 %	Na	9.42 %	Na_2O
Titanium	21.83 %	Ti	36.41 %	TiO_2
Niobium	14.12 %	Nb	20.20 %	Nb_2O_5
Silicon	8.54 %	Si	18.26 %	SiO_2
Hydrogen	1.26 %	H	11.29 %	H_2O
Oxygen	41.33 %	O		
	100.00 %		102.74 %	= TOTAL OXIDE

- Empirical Formula: $Na_2KTi_3NbO_{4.75}(SiO_4)_2(OH)_{0.25}\cdot 4(H_2O)$
- IMA Status: Approved IMA 1990
- Locality: Link to MinDat.org Location Data.
- Synonym: IMA1989-051

Sitinakite Image

- Images:

Sitinakite

Comments: Beige translucent crudely formed sitinakite (arrow) crystal with white natrolite and dark, acicular aegirine.
Location: Mount Kukisvumchorr, Khibiny Massif, Kola Peninsula, Murmansk District, Russia. Scale: See Photo.

Sitinakite Crystallography

- Axial Ratios: a:c = 1:1.54738
- Cell Dimensions: a = 7.819, c = 12.099, Z = 2; V = 739.69 Den(Calc)= 2.95
- Crystal System: Tetragonal - Ditetragonal DipyramidalH-M Symbol (4/m 2/m 2/m) Space Group: P 4_1/mcm

- X Ray Diffraction: By Intensity(I/I_o): 6.02(1), 7.84(1), 3.25(0.8),

Physical Properties of Sitinakite

- Cleavage: [???] Perfect
- Color: Colorless, Light brown, Pink.
- Density: 2.86
- Diaphaniety: Transparent to Translucent
- Hardness: 4.5 - Between Fluorite and Apatite
- Luster: Vitreous (Glassy)
- Streak: white

Optical Properties of Sitinakite

- Gladstone-Dale: CI meas= -0.012 (Superior) - where the CI = $(1-KP_{Dmeas}/KC)$
  CI calc= 0.019 (Excellent) - where the CI = $(1-KP_{Dcalc}/KC)$
  KP_{Dcalc}= 0.2997, KP_{Dmeas}= 0.3091, KC= 0.3055
- Optical Data: Uniaxial (+), w=1.78, e=1.988, bire=0.2080.

Calculated Properties of Sitinakite

- Electron Density: $\rho_{electron}$=2.78 gm/cc
  note: $\rho_{Sitinakite}$ =2.86 gm/cc.
- Photoelectric: $PE_{Sitinakite}$ = 25.15 barns/electron
  $U=PE_{Sitinakite} \times \rho_{electron}$= 70.02 barns/cc.
- Radioactivity: GRapi = 83.42 (Gamma Ray American Petroleum Institute Units)

Estimated Radioactivity from Sitinakite) - barely detectable

Specimen Size Weight/Volume (Sphere) *	Calculated Activity Bequerols (Bq)	Calculated Activity Curies (Ci)	Estimated Activity GR(api)	Estimated Exposure (mRem**)/hr If Held in Hand For One Hour
1000 gm / 8.74 cm	1,800	4.86E-08	83.42	0.03
100 gm / 4.06 cm	180	4.86E-09	8.34	0.00
10 gm / 1.88 cm	18	4.86E-10	0.83	0.00
1 gm / 8.74 mm	2	4.86E-11	0.08	0.00
0.1 gm / 4.06 mm	0	4.86E-12	0.01	0.00
0.01 gm / 1.88				

mm	0	4.86E-13	0.00	0.00
0.001 gm / 0.87 mm	0	4.86E-14	0.00	0.00

Weight of pure Sitinakite in grams (gm) and Calculated Diameter of a Sphere with a Density of 2.86 gm/cc.*
Goverment Estimate of Average Annual Exposure (360 mRem) **
Note: 10 microsieverts/hr = 1 mRem/hr **
Max Permissable Adult Dose 50,000 mRem/yr (hands), 15,000 mRem/yr (eyes)
Lethal Dose LD(50) Exposure 400,000 to 500,000 mRem

Sitinakite Classification

Dana Class: 52.4.11.1 (52)Nesosilicate Insular SiO4 Groups and O, OH, F, and H2O
(52.4)with cations in [6] and/or > [6] coordination
(52.4.11)Dana Group

52.4.11.1 Sitinakite $Na_2K(Ti,Nb)_4O_4(SiO_4)_2(O,OH)\cdot 4(H_2O)$ P $4_1/mcm$ 4/m 2/m 2/m

Strunz Class: VIII/B.16-30 VIII - Silicates
VIII/B - Nesosubsilicates, with anions unfamiliar to tetraheders, cationes with coordinationnumber between [8] and [12]
VIII/B.16 - Ilmajokite - Tundrite-(Nd) series

VIII/B.16-20 Ilmajokite $(Na,Ce,La,Ba)_2TiSi_3O_5(OH)_{10}\cdot n(H_2O)$ (?) C 2/c or Cc Mono

VIII/B.16-30 Sitinakite $Na_2K(Ti,Nb)_4O_4(SiO_4)_2(O,OH)\cdot 4(H_2O)$ P $4_1/mcm$ 4/m 2/m 2/m

VIII/B.16-40 Tundrite-(Ce) $Na_3(Ce,La)_4(Ti,Nb)_2(SiO_4)_2(CO_3)_3O_4(OH)\cdot 2(H_2O)$ P1 1

VIII/B.16-50 Tundrite-(Nd) $Na_3(Nd,La)_4(Ti,Nb)_2(SiO_4)_2(CO_3)_3O_4(OH)\cdot 2(H_2O)$ P1 1

Other Sitinakite Information

References: PHYS. PROP.(Am.Min.,Vol.78,p1317,1993) OPTIC PROP. (Am.Min.,Vol.78,p1317,1993)

See Also:

Links to other databases for Sitinakite :
1 -Athena 2 - EUROmin Project 3 -Google Images 4 - Handbook of Mineralogy 5 -MinDAT 6 -MinMax(Deutsch) 7 -MinMax(English) 8 - WWW-MINCRYST 9 -École des Mines de Paris

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Fabre Minerals
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Sitinakite

Na2K(Ti,Nb)4O4(SiO4)2(O,OH)·4(H2O)
Dana No: 52.4.11.1 Strunz No: VIII/B.16-30

Locality:

Notes:

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